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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,696	10/22/2003	Masahiro Saitou	107443-00033	4630

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ARENT FOX PLLC
1050 CONNECTICUT AVENUE, N.W.
SUITE 400
WASHINGTON, DC 20036

EXAMINER

KOSOWSKI, ALEXANDER J

ART UNIT	PAPER NUMBER
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2125

DATE MAILED: 08/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/689,696

Applicant(s)

SAITOU, MASAHIRO

Examiner

Alexander J. Kosowski

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,7,9 and 10 is/are rejected.
- 7) ☒ Claim(s) 3-5 and 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/22/03, 1/21/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

- 1) Claims 1-10 are presented for examination.

Claim Objections

- 2) Claims 2-5 are objected to because of the following informalities:

Referring to claims 2-5, every claim uses the word "comprising" in the preamble. The word should read --comprises--.

Appropriate correction is required.

Allowable Subject Matter

- 3) Claims 3-5 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 103

- 4) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- 5) Claims 1, 6-7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolt et al (U.S. Pat 5,424,941), further in view of Liao (U.S. Pat 6,705,199), further in view of Ohsumi (U.S. Pat 5,718,160).

Referring to claim 1, Bolt teaches a device comprising a hydraulic cylinder and a piston member slidably accommodated in the hydraulic cylinder including a piston head and a rod extending from the piston head along the central axis direction (col. 2 lines 24-36), the inside of

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the hydraulic cylinder being divided into two pressure chambers by the piston head (col. 2 lines 30-36); a hydraulic circuit for supplying a fluid at a constant pressure to one of the two pressure chambers and supplying the fluid at a controlled flow rate to the other of the pressure chambers via a servo valve (col. 1 lines 53-64); first and second pressure sensors for detecting pressures of the one and the other of the pressure chambers, respectively (col. 2 lines 36-43); a position sensor for detecting the position of the piston member (col. 2 lines 52-55); and a control system, wherein the control system performs position control with respect to the piston member by controlling the servo valve based on a position detection signal from the position sensor (col. 3 lines 34-37), and a position, velocity, and acceleration command value (col. 3 lines 32-35); and wherein the control system performs force control with respect to the piston member by controlling the servo valve using pressure detection signals from each of the first and second pressure sensors and a load command value (col. 1 lines 50-59 and col. 2 lines 36-43).

However, Bolt does not explicitly teach that the hydraulic cylinder is fixed so as to extend along the vertical direction, nor that the piston is slidably accommodated in the hydraulic cylinder in a non-contact state via bearings.

Liao teaches a precision control system comprising a hydraulic cylinder with a piston controlled by a servo control system (col. 4 lines 55-63) whereby the cylinder is fixed so as to extend along the vertical direction (col. 15 lines 12-30).

Ohsumi teaches a positioning device comprising a hydraulic cylinder with a piston which is accommodated via bearings in the cylinder (col. 3 lines 50-55).

Therefore, it would also have been obvious to one skilled in the art at the time the invention was made to vertically position the hydraulic cylinder in the invention taught by Bolt

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since this would allow for vertical applications of the device which utilize the muscle of air to provide thrust in a pneumatic servo system (Liao, col. 23 lines 20-26).

Therefore, it would also have been obvious to one skilled in the art at the time the invention was made to utilize bearings in the cylinder taught by Bolt since this would allow a supply of fluid to hydrostatically support the piston which allows for improved characteristics such as increased shock absorption (Ohsumi, col. 5 lines 35-40).

Referring to claim 6, Ohsumi further teaches that the piston member has a hole formed in the central axis portion thereof and extending along the central axis direction thereof, and wherein the position sensor is formed in the piston member through the use of a fixed shaft that has been inserted into the hole from above the hydraulic cylinder (col. 4 lines 53-59 and col. 7 lines 48-51).

Referring to claim 7, Ohsumi further teaches that the bearings are each a first hydrostatic bearing, and wherein the first hydrostatic bearings are constructed by forming, in the piston head, first passages for introducing therein the fluid in the one of pressure chambers and blowing the fluid onto the inner wall of the hydraulic cylinder (col. 3 lines 50-55 and col. 7 lines 38-47).

Referring to claim 10, Bolt teaches using the device in a processing machine (col. 1 lines 5-40).

6) Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bolt, Liao and Ohsumi, further in view of Kawakami (U.S. Pat 5,673,615).

Referring to claim 2, Bolt, Liao and Ohsumi teach the above. However, they do not explicitly teach a position control system that performs the position control until the piston

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member arrives at a target position, a force control system that performs the force control with respect to the piston member by a force based on the load command value, when the piston member arrives at the target position and a switching section that performs switching between the position control system and the force control system.

Kawakami teaches a machine which utilizes a force control and position control and switches between them with a switching section when a specific position is reached (col. 3 lines 1-25).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize a switch between force control and position control in the invention taught above since this would allow for high precision operations to be carried out by controlling motion in a pair of control modes (Kawakami, col. 2 lines 56-64).

7) Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bolt, Liao and Ohsumi, further in view of Eigenbrod (U.S. Pat 5,391,002).

Referring to claim 9, Bolt, Liao and Ohsumi teach the above. However, they do not explicitly teach that the rod is slidably supported on the lower end of the hydraulic cylinder in a non-contact state via second hydrostatic bearings, and wherein the second hydraulic bearings are constructed by forming, in the hydraulic cylinder, a third passage for introducing therein the fluid in the one of the pressure chambers and blowing the fluid onto the outer wall of the rod.

Eigenbrod teaches a servo cylinder system which utilizes a hydrostatic bearing around a rod comprised of blowing fluid onto the outer wall of the rod (col. 5 lines 4-34).

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Therefore, it would have been obvious to one skilled in the art at the time the invention was made to utilize a hydrostatic bearing around a rod in the invention taught above since this would keep friction losses as low as possible (Eigenbrod, col. 4 lines 48-50).

Conclusion

8) The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yo et al (U.S. pat 6,799,501) – teaches a pressure cylinder.

Pratt et al (U.S. Pat 6,494,039) – teaches a force-controlled actuator.

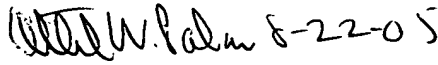
Bolotin et al (U.S. pat 6,467,824) – teaches a pick and place actuator system.

9) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander J Kosowski whose telephone number is 571-272-3744. The examiner can normally be reached on Monday through Friday, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on 571-272-3749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. In addition, the examiner's RightFAX number is 571-273-3744.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Alexander J. Kosowski
Patent Examiner
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ALBERT W. PALADINI
PRIMARY EXAMINER

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